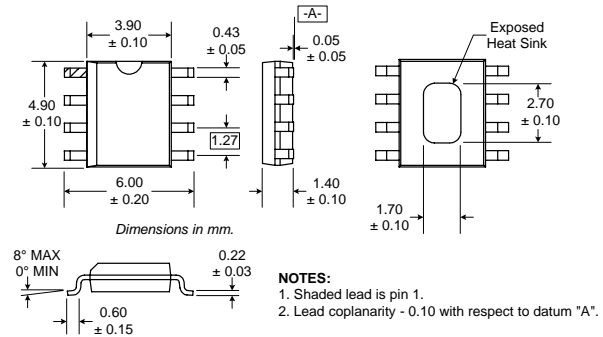


Typical Applications

- 2.14GHz UMTS Systems
- Digital Communication Systems
- PCS Communication Systems
- Commercial and Consumer Systems

Product Description

The RF5187 is a highly-linear, low-power amplifier IC. It has been designed for use as the driver RF amplifier in applications such as W-CDMA basestations. The RF5187 requires an input and output matching network and power supply feed line. The device is manufactured on an advanced Gallium Arsenide HBT process, and is packaged in a 8-pin plastic package with a backside ground.



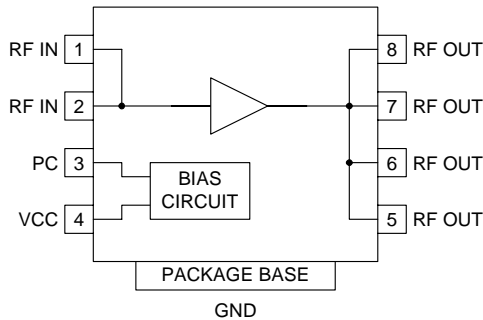
Optimum Technology Matching® Applied

- Si BJT       GaAs HBT       GaAs MESFET  
 Si Bi-CMOS       SiGe HBT       Si CMOS

Package Style: SOIC-8 Slug

**Features**

- Single 3V to 6V Supply
- 10dBm to 20dBm Ultra Linear Output Power
- 14dB Gain at 2.14GHz
- Power Down Mode
- 800MHz to 2500MHz Operation



Functional Block Diagram

**Ordering Information**

RF5187      Low Power Linear Amplifier  
 RF5187 PCBA      Fully Assembled Evaluation Board

RF Micro Devices, Inc.      Tel (336) 664 1233  
 7625 Thorndike Road      Fax (336) 664 0454  
 Greensboro, NC 27409, USA      <http://www.rfmd.com>

### Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage ( $V_{CC}$ )	-0.5 to +7.5	$V_{DC}$
Power Control Voltage ( $V_{PC}$ )	-0.5 to +5V	V
DC Supply Current	450	mA
Input RF Power	+20	dBm
Output Load VSWR	20:1	
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +100	°C



**Caution!** ESD sensitive device.

RF Micro Devices believes the furnished information is correct and accurate at the time of this printing. However, RF Micro Devices reserves the right to make changes to its products without notice. RF Micro Devices does not assume responsibility for the use of the described product(s).

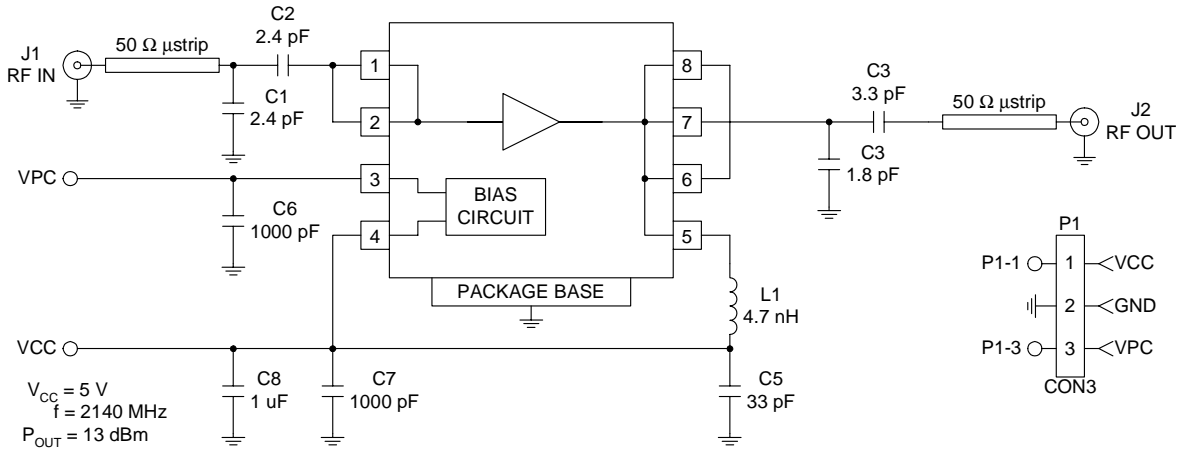
Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
<b>Overall</b>					$T=25^{\circ}\text{C}$ , $V_{CC}=5.0\text{V}$ , $I_{CC}=240\text{mA}$ , Freq=2140MHz, $P_{OUT}=13\text{dBm}$
Frequency Range	800		2500	MHz	
Output Power		13		dBm	
OP1dB		29		dBm	
Small Signal Gain	13		15	dB	
Input VSWR		1.5:1			With external matching network.
<b>Two-Tone Specification</b>					
Output IP3	42	43	45	dBm	13dBm per tone.
<b>Power Control</b>					
$V_{PC}$	2.7	3.1	3.7	V	To obtain 240mA idle current.
Power Control "OFF"	0.2	0.5		V	Threshold voltage at device input.
<b>Power Supply</b>					
Power Supply Voltage	5		6	V	
Supply Current			240	mA	
Power Down Current		2	10	$\mu\text{A}$	$V_{PC}=0.2\text{V}$

Pin	Function	Description	Interface Schematic
1	RF IN	RF input. This input is DC-coupled, so an external blocking capacitor is required if this pin is connected to a DC path. An optimum match to $50\Omega$ is obtained by providing an external series capacitor of 2.4pF and then a shunt capacitor of 2.4pF. Those values are typical for 2140MHz; other values may be required for other frequencies.	
2	RF IN	Same as pin 1.	
3	PC	Power control pin. For obtaining maximum performance, the voltage on this pin can be used to set correct bias level. In a typical application this is implemented by a feedback loop. The feedback can be based on the actual supply current of the device (i.e. maintaining a fixed current level), or it can be based on the RF output power level to maintain a fixed RF power level (Automatic Level Control loop). A voltage of 0.5V or lower brings the part into power down state.	
4	VCC	Power supply pin for the bias circuits. External low frequency bypass capacitors should be connected if no other low frequency decoupling is nearby.	
5	RF OUT	RF output and bias for the output stage. The power supply for the output transistor needs to be supplied to this pin. This can be done through a quarter-wavelength microstrip line that is RF-grounded at the other end, or through an RF inductor that supports the required DC currents. Optimum load impedance is achieved by providing a shunt capacitor of 1.8pF and a series capacitor of 3.3pF. Those values are typical for 2140MHz; other values may be required for other frequencies. Since there are several output pins available (which are internally connected), one pin can be used for connecting the bias, another for connecting a (third) harmonic trap filter, and the other pins for the RF output.	
6	RF OUT	Same as pin 5.	
7	RF OUT	Same as pin 5.	
8	RF OUT	Same as pin 5.	
Pkg Base	GND	Ground connection. The backside of the package should be connected to the ground plane through a short path (i.e., vias under the device may be required).	

Evaluation Board Schematic  
2140MHz Operation

(Download [Bill of Materials](http://www.rfmd.com) from [www.rfmd.com](http://www.rfmd.com).)

**2**  
POWER AMPLIFIERS



Evaluation Board Layout  
Board Size 1.5" x 1.0"  
Board Thickness 0.031", Board Material FR-4

